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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,558	12/12/2001	Martin Baumann	FER-12790	9291

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EXAMINER

ZACHARIA, RAMSEY E

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 11/21/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.

ed21

Office Action Summary

Application No.

10/021,558

Applicant(s)

BAUMANN ET AL.

Examiner

Ramsey Zacharia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 25-28 is/are allowed.
- 6) ☒ Claim(s) 20-24 and 29-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>11</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Information Disclosure Statement

2. Reference EP-0909747-A1 in the IDS filed 11 August 2003 has been lined through because the reference is not in the English language and there is no concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 20-24, 29-35, and 37-40 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a new matter rejection. Support could not be found in the disclosure as originally filed for the concept of applying a fired-on coating to any substrate (as recited in claims 33, 35, and 37-40), specifically a plastic substrate (as recited in claims 20-24, 29-32, and

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34). The coating of Example 1 is fired at 660 °C, a temperature that would be expected to destroy a plastic substrate. The disclosure as originally filed does not convey to one skilled in the art how a coating could be fired onto a plastic substrate at the temperatures disclosed. See also paragraph 0050 of the instant specification, particularly the proviso that the substrate must be able to withstand the heat of the firing process. Regarding claim 24, although the claim does not explicitly recite a firing step, the glass or Me-O-Me layer forming material is disclosed only as being formed by a firing process (see paragraph 0051 of the instant specification).

5. Claims 21-24 and 36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claims 21-23 are rendered indefinite because they depend from cancelled claim 1. This rejection may be overcome by amending the claims to depend from claim 20.

7. Claim 22 is further rendered indefinite because the Markush group of particles includes "organic polymers" on line 6 of the claim. It is unclear how the coating can be a fired-on coating and still contain organic polymers.

8. Claim 24 is rendered indefinite because it refers to a layer forming material as "inorganic or organic" on line 9 and "a glass or a material operable to form Me-O-Me' structural elements" on lines 11-12. However, a glass or a material operable to form Me-O-Me' structural elements (with Me as defined in the claim) is an inorganic material and not an organic material. This rejection may be overcome by deleting the phrase "or organic" on line 9 of the claim.

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9. Claim 36 is rendered indefinite because the claim does not specify the liquid that results in the claimed contact and off rolling angles.

Claim Rejections - 35 USC § 102

10. Claim 36 is rejected under 35 U.S.C. 102(b) as being anticipated by Shouji et al. (U.S. Patent 6,068,911).

Shouji et al. teach a super water repellent coating that may be applied to the windshield of an automobile, i.e. a glass pane (column 1, lines 7-29). The embodiments recited in Table 1 all have water contact angles of greater than 150°.

Shouji et al. do not specify the off rolling angle of their material. However, the off rolling angle, like the contact angle, is a function of the surface tension of the liquid on the surface. Since the surface of Shouji et al. is designed to be super water repellent and since it has a contact angle that is greater than about 150°, the surface is taken to inherently possess an off rolling angle of less than about 1°.

11. Claims 20-24, 29-31, 33, 35, 37, 39, and 40 are rejected under 35 U.S.C. 102(b) as being anticipated by Doushita et al. (U.S. Patent 6,156,409).

Doushita et al. teach a coating comprising fine metal oxide particles having a diameter of 4 to 300 nm (column 2, lines 6-13). The coating further comprises an organometallic compound, such as a silicate (column 3, lines 31-49). In the embodiment of Example 1, the coating comprises a solution of silica particles having a diameter of 10-20 nm in a silane binder and the coating is applied to a glass substrate by dipping (column 14, line 59-column 15, line 9). The

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coated glass is then heat treated at 500 °C, i.e. fired (column 15, lines 11-15). Upon heating, the silane binder will form structural elements of Si-O-Si. The weight ratio of silane to silica is 11.8:13.3, about 1:1.1.

Regarding claim 33, the limitations of element (iii) are taken to be met because the claim does not recite the degree to which the surface is hydrophobized. As noted by the applicant on page 12 of the response filed 11 August 2003, "the claim element is satisfied at *any degree* of hydrophobicity" (emphasis in original). Water on the coating of Doushita et al. exhibits a contact angle which is an indication that the water does not completely wet the surface. Therefore, the surface is at least somewhat hydrophobic.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 20-24, 29-31, 33, 35, and 37-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi et al. (U.S. Patent 5,424,130) in view of Ogawa et al. (U.S. Patent 5,437,894).

Nakanishi et al. teach a water repellent coating comprising an SiO₂ ceramic applied to a glass substrate (column 2, lines 5-22). The ceramic may also contain a metal oxide like titanium dioxide, aluminum oxide, zirconium oxide, or the like (column 2, lines 30-51). The coating is formed by first applying a coating film to a glass substrate followed by burning (i.e. firing) the

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film (column 3, lines 42-54). In the embodiment of Example 3, the coating comprises a titanium alkoxy compound and is applied by dipping the substrate into the coating composition (column 7, line 60-column 8, line 17).

Nakanishi et al. do not teach that their composition comprises zinc oxide or lead oxide. However, there is an explicit teaching that the composition comprises metal oxides such as "TiO₂, Al₂O₃, ZrO₂ and so on" (column 2, lines 42). From this it would be obvious to one of ordinary skill in the art to use any transition metal oxide, including lead and zinc oxides, since one of ordinary skill would understand the "and so on" to indicate that other similar metal oxides may be used.

Nakanishi et al. do not teach the addition of particles having an average diameter of less than 100 nm to their composition.

Ogawa et al. is directed to a water and oil repelling coating film having surface irregularities (column 2, lines 25-34). The surface irregularities are formed by the inclusion of particles in the coating layer (column 2, lines 56-64). The extent of the surface irregularities can be controlled according to the diameter and amount of particles added to the coating (column 9, lines 28-35). The surface irregularities are preferably as low as 10 nm (column 12, lines 44-50). In the embodiments of the Examples, the particles are silica particles.

One of ordinary skill in the art would be motivated to add particles to the coating composition of Nakanishi et al. to improve the water and oil repellency of the resulting coating.

Moreover, by teaching that the diameter and amount of the particles affects the extent of the surface irregularities and therefore the degree of water repellency, Ogawa et al. demonstrate that particle size and amount are results effective variables. As such, it would have been obvious

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to one having ordinary skill in the art at the time the invention was made to optimize the size and amount of particles within the coating, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Therefore, the inventions of claims 20-24, 29-31, 33, 35, and 37-40 would have been obvious to one of ordinary skill in the art at the time the inventions were made.

Allowable Subject Matter

14. Claims 25-28 are allowed.

15. The following is a statement of reasons for the indication of allowable subject matter.

The inventions of claims 25-28 are directed to a coated substrate comprising a substrate of glass, ceramic, plastic, metal, or glazed or enameled material and a coating comprising nanoscale particles having an average diameter of less than 100 nm. The coating further comprises a layer forming material that binds the particles to the substrate. Additionally, the coating further comprises microscale particles having an average diameter of about 0.1-50 μm . The microscale particles are either contained in the coating layer having the nanoscale particles or the microscale particles are contained in a layer underneath the layer containing the nanoscale particles.

Shouji et al., Nakanishi et al., and Ogawa et al. represent the closest prior art. However, none of these references teach or fairly suggest a coating that comprises microscale particles having an average diameter of 0.1-50 μm in addition to nanoscale particles having an average diameter of less than 100 nm.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

17. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 11 August 2003 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609(B)(2)(i). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period


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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramsey Zacharia whose telephone number is (703) 305-0503. The examiner can normally be reached on Monday through Friday from 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau, can be reached on (703) 308-2367. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Ramsey Zacharia
Primary Examiner
Tech Center 1700